

Amendments to the Specification:

Please replace the paragraph beginning on page 3, line 13 and ending on page 3, line 17, with the following rewritten paragraph:

The laser (Laser A-D) radiation generated in the light source is focussed in the preparation in a diffraction-limited manner by means of the objective (2) via the scanner, scanning optics and tube lens. The focus scans the specimen in a point raster in x-y direction. The pixel dwell times when scanning over the specimen are mostly in the range of less than one microsecond to several seconds.

Please replace the paragraph beginning on page 3, line 18 and ending on page 3, line 28, with the following rewritten paragraph:

In confocal detection (descanned detection) of fluorescent light, the light emitted from the focal plane (specimen) and from the planes located above and below the latter reaches a dichroic beam splitter (MDB) via the scanner. This dichroic beam splitter separates the fluorescent light from the excitation light. The fluorescent light is subsequently focused on a diaphragm (confocal diaphragm/pinhole) located precisely in a plane conjugate to the focal plane. In this way, fluorescent light components outside of the focus are suppressed. The optical resolution of the microscope can be adjusted by varying the size of the diaphragm. Another dichroic blocking filter (~~EF~~) (EF 1-5) which again suppresses the excitation radiation is located behind the diaphragm. After passing the blocking filter, the fluorescent light is measured by means of a point detector (~~PMT~~) (PMT 1-5).

Please replace the paragraph beginning on page 8, line 11 and ending on page 9, line 2, with the following rewritten paragraph:

The method according to the invention is based on a spectrally split detection of fluorescence. For this purpose, the emission light is split from the excitation light in the scan module or in the microscope (with multiphoton absorption) by means of an element for separating the excitation radiation from the detected radiation, such as the main color splitter

(MDB) or an AOTF according to 7346DE or 7323DE. With transmitted-light arrangements, this type of element can also be entirely omitted. A block diagram of the detector unit to be described is shown in Fig. 5. With confocal detection, the light L from the specimen is focused through a diaphragm (pinhole) PH by means of imaging optics PO, so that fluorescence occurring outside of the focus is suppressed. In non-descanned detection, the diaphragm is omitted. The light is now divided into its spectral components by means of an angle-dispersive element DI. The angle-dispersive elements can be prisms, gratings and, e.g., acousto-optic elements. The light which is split into its spectral components by the dispersive element is subsequently imaged on a line detector DE. This line detector DE measures the emission signal S as a function of wavelength and converts it into electrical signals. By means of a wavelength scanner WS according to the invention, which will be described more fully in the following, the position of the fluorescence spectrum relative to the line detector can be shifted in a defined manner by a distance dl by displacement of the PMT in Fig. 6 Fig. 5 or by swiveling a grating or mirror by a rotational angle phi (Fig. 6, among others). In addition, a line filter for suppressing the excitation wavelengths can be arranged in front of the detection unit.

Please replace the paragraph beginning on page 15, line 13 and ending on page 16, line 2, with the following rewritten paragraph:

Fig. 11a shows the dependency of the detector resolution on the quantity of shifts n with reference to the spectrometer arrangement described above. For n=1, the spectral resolution of the detection unit is equal to the spectral resolution of an individual channel (L), that is, approximately 10 nm. The spectral resolution of the detection unit is 2 nm for a 5-times wavelength shift by L/5. The maximum spectral resolution that can be achieved is determined by the quantity of lines of the grating that is used. This maximum spectral resolution $\Theta\Delta(\Delta\lambda)$ is reached according to the Nyquist sampling theorem precisely when the detector resolution is equal to half the potential resolution of the spectrometer arrangement $\Theta\Delta(\Delta\lambda)$. This corresponds to a quantity as follows:

$$n_{\max} = 2 \cdot \frac{L}{\Delta\lambda}$$

and in this case is $n_{\max}=13$. When the quantity of shifts is greater than n_{\max} , the spectral components are sampled too often and there is no further increase in resolution. When n is less than n_{\max} , too few spectral components are sampled and the resolution of the detection unit is determined by the detector.

Please replace the paragraph beginning on page 16, line 15 and ending on page 17, line 2, with the following rewritten paragraph:

For faster evaluation, the integrator I can be followed by a comparator K which, as a simple comparator, has a switching threshold such that a digital output signal is generated when this threshold is exceeded or which is constructed as a window comparator and then forms a digital output signal when the input signal lies between the upper and lower switching threshold or when the input signal lies outside (below or above) the switching thresholds. The comparator or window comparator can be arranged before as well as after the integrator. Circuit arrangements without an integrator (so-called amplifier mode) are also possible. With the amplifier mode arrangement, the comparator K is also arranged after corresponding level matching. The output of the comparator K serves as a control signal for a switch register Reg which directly switches the active channels (online), or the state is conveyed to the computer via an additional connection V in order to make an individual selection of active channels (offline). The output signal of the integrator I is fed directly to another amplifier A1 for level matching for the subsequent analog-to-digital conversion ~~AD~~ by an ADC. The A-D-converted values are transferred via suitable data transfer to a computer (PC or digital signal processor DSP).